thus, does not narrow the claim scope with its addition to the claim. Claims 4-8 and 41-43 have been amended to correct the claim dependency in view of the cancellation of claim 3. Claim 44 has been amended for clarity. Applicants do not intend to change the claim scope with the amendment to claim 44, which substitutes the terminology at page 41, lines 17-21 with the equivalent terminology at page 42, lines 19-31. No new matter is introduced by the amendments.

All of the pending claims stand rejected. Applicants respectfully request reconsideration of the rejections based on the following comments.

Rejections Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 44 under 35 U.S.C. § 112, second paragraph as being indefinite. Specifically, the Examiner indicated that the expressions "different levels" and "plane within the material" are undefined. Although the phrase "different levels" is clear in view of the description in the specification, Applicants have amended to claim to read "different layers" for further clarity. Applicants also assert that the phrase "plane within the material" is clear. Nevertheless, Applicants have deleted the phrase "relative to a plane" to be consistent with the present use of the term "layer" within the claim. Claim 44 is clear and definite. Applicants respectfully request withdrawal of the rejection of claim 44 under 35 U.S.C. § 112, second paragraph as being indefinite.

Rejections Under 35 U.S.C. § 102(b) Over Clark et al.

The Examiner rejected claims 1, 9 and 11-12 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,728,591 to Clark et al. (the Clark patent). Claim 1 has been amended to incorporate some features of claim 3, as filed. Claim 1 and claims depending from

claim 1 are not prima facie anticipated by the Clark patent. Applicants respectfully request reconsideration of the rejection based on the following comments.

Claim 1 presently indicates that the self-assembled structures comprise inorganic particles. The Clark patent does not teach or suggest self-assembled structures comprising inorganic particles. Since the Clark patent does not disclose self-assembled structures comprising inorganic particles, the Clark patent does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 1, 9 and 11-12 under 35 U.S.C. § 102(b) as being anticipated by the Clark patent.

Rejection Under 35 U.S.C. § 103(a) Over Clark et al.

The Examiner rejected claims 13 and 14 under 35 U.S.C. § 103(a) over the Clark patent. Claim 1, from which claims 13 and 14 depend, has been amended to incorporate some features of claim 3, as filed. In particular, the claims refer to a self-assembled structure comprising inorganic particles. Since the Clark patent does not teach or suggest self-assembled structures comprising inorganic particles, the Clark patent does not render Applicants claimed invention prima faice obvious. Applicants respectfully request withdrawal of the rejection of claims 13 and 14 under 35 U.S.C. § 103(a) over the Clark patent.

Rejections Over Debe et al.

The Examiner rejected claims 1-8, 11, 12, 15, 16, 41-43 and 45-53 under 35 U.S.C. § 103(a) over U.S. Patent 5,879,827 to Debe et al. (the Debe patent). In response to Applicants' previous arguments over the Debe patent, the Examiner asserts that the Debe patent discloses self-assembled layers as discrete islands. Applicants maintain that the Debe patent does not anticipate Applicants' claimed invention with respect to discrete islands. Applicants

clarify the distinctions with the Debe patent below. Applicants respectfully request reconsideration of the rejections based on the following comments.

With respect to claims 1-8, 11, 12 and 41-44, Applicants' claimed invention is directed to a structure with **two scales of organization**. At the **first** scale of organization, the structure is organized into a **plurality** of domains or islands. "To form the structure within the prescribed boundaries, the production of the self-assembled structures of interest generally requires a process defining the extent of the structure and a **separate** self-assembly process." (Specification at page 39, lines 5-9, emphasis added.) See for example, Fig. 7 of Applicants' specification, which discloses six domains. **Localization** of these domains generally does **not** involve a self-assembly process. As described in detail in Applicants specification, the localization can involve, for example, lithography, masking, focused radiation and the like. See, for example, page 7, lines 4-18, page 39, line 5 to page 40, line 2, page 41, line 4 to page 42, line 31, and page 45, line 32 to page 48, line 8. The **activation/deactivation** processes define the spatial extent of the domains.

Within **each domain,** a self-assembled structure is formed. Applicants' specification describes several self-assembly approaches for the formation of the structures within localized domains. See, for example, page 39, line 33 to page 40, line 18 and page 48, line 16 to page 54, line 3. These self-assembled structures are within particular domains/islands that are localized within the structure.

In contrast, the Debe patent discloses a structured material formed by various deposition processes. The microstructured material in the Debe patent involves an organic microstructured layer and a catalyst deposited on top of the organic microstructured layer. For example, see column 5, lines 49-57. Catalyst materials are deposited as a coating material on top of the organic microstructured layer. See, for example, column 10, lines 52-62. In some embodiments, the catalyst coating layer can be organic materials for forming self-assembled

layers. And for the deposition of inorganic materials, the coating can form discrete islands of a coating of inorganic material. As described by the Debe patent, the formation of discrete islands involves materials (i.e., metal or alloy catalysts) that do not self-assemble and the self-assembly involves materials (i.e., organic polymers) that do not form the discrete islands. **Thus, the Debe patent does not disclose the combination of self-assembly and discrete islands.** Similarly, the Debe patent does not disclose any significance with respect to either the self-assembly or to the discrete islands. Therefore, the Debe patent does not suggest or motivate the combination of self-assembly and discrete islands. Since the Debe patent does not teach, suggest or motivate the combination of the self-assembly and the formation of discrete islands, the Debe patent does not render claims 1-8, 11, 12 and 41-44 prima facie obvious.

With respect to claims 15, 16 and 45-53, the Debe patent does not teach or suggest inorganic **particles**. The Examiner pointed to column 4, lines 56-60 of the Debe patent for the disclosure of particles. While it is unclear if these "particles" of the Debe patent are particles as claimed by Applicants, it is clear that the Debe particles are organic since they are formed from perylene red (column 4, lines 50-52 and column 7, lines 63-67). Since the Debe patent does not teach or suggest inorganic particles as claimed by Applicants, the Debe patent does not render claims 15, 16 and 45-53 prima facie obvious.

Since the Debe patent does not render Applicants' claimed invention prima facie obvious, Applicants respectfully request the withdrawal of the rejection of claims 1-8, 11, 12, 15, 16, 41-43 and 45-53 under 35 U.S.C. § 103(a) over the Debe patent.

Rejections Over Alivisatos et al.

The Examiner rejected claims 1, 3 and 8-12 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,751,018 to Alivasatos et al. (the Alivasatos patent). Applicants have amended claim 1 to clarify the nature of the claimed structures. In particular, Applicants have

clarified that the islands are **selected** and are not a random manifestation of partial coverage. The Alivasatos patent does not prima facie anticipate the claimed invention. Applicants respectfully request reconsideration of the rejection based on the following comments.

As noted by the Examiner, the Alivasatos patent discloses clustering of deposits resulting from less than monolayer coverage. In other words, with a one-half monolayer coverage, the structures disclosed in the Alivasatos patent form clusters covering the deposited fraction of a monolayer.

In contrast, Applicants disclose and claim organization of the self-assembled structures into **selected** islands. As described in detail above, Applicants' approach involves two levels of organization, a localization approach to form selected domains/islands and a self-assembly process to form self-assembled structures within the selected islands. The random clustering due to formation of less than a monolayer, as disclosed in the Alivasatos patent does not anticipate Applicants' claimed structure involving organized, **selected** islands.

Since the Alivasatos patent does not disclose self-assembly within selected islands, the Alivasatos patent does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request withdrawal of the rejection of claims 1, 3 and 8-12 under 35 U.S.C. § 102(b) as being anticipated by the Alivasatos patent.

CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,

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Shari R. Thorndike

June 19, 2002
Date

Shari R. Thorndike

ATTACHMENT
MARKED-UP AMENDMENT

Specification As Amended

At page 26, lines 12-31, the paragraph has been amended as follows:

The conditions to convert crystalline VO_2 to orthorhombic V_2O_5 and 2-D crystalline V_2O_5, and amorphous V_2O_5 to orthorhombic V_2O_5 and 2-D crystalline V_2O_5 are described in U.S. Patent 5,989,514, to Bi et al., entitled "Processing of Vanadium Oxide Particles With Heat," incorporated herein by reference. Conditions for the removal of carbon coatings from metal oxide nanoparticles are described in U.S. Patent Application Serial No. 09/123,255, now U.S. Patent 6,387,531 entitled "Metal (Silicon) Oxide/Carbon Composite Particles," incorporated herein by reference. The incorporation of lithium from a lithium salt into metal oxide nanoparticles in a heat treatment process is described in copending and commonly assigned U.S. Patent Application Serial No. 09/311,506, now U.S. Patent 6,394,494 to Reitz et al., entitled "Metal Vanadium Oxide Particles," and copending and commonly assigned U.S. Patent Application Serial No. 09/334,203 to Kumar et al., entitled "Reaction Methods for Producing Ternary Particles," both of which are incorporated herein by reference.

At page 30, lines 9-19, the paragraph has been amended as follows:

In particular, the production of vanadium oxide nanoparticles is described in copending and commonly assigned U.S. Patent Applications Serial No. 08/897,778, now U.S. Patent 6,106,798 to Bi et al., entitled "Vanadium Oxide Nanoparticles," incorporated herein by reference. Similarly, silver vanadium oxide nanoparticles have been produced, as described in copending and commonly assigned U.S. Patent Applications Serial Nos. 09/246,076, now U.S.

Patent 6,225,007, and 09/311,506, now U.S. Patent 6,394,494, both entitled "Metal Vanadium Oxide Particles," both of which are incorporated herein by reference.

At page 31, lines 14-32, the paragraph has been amended as follows:

The production of titanium oxide nanoparticles is described in copending and commonly assigned, U.S. Patent Application Serial Number 09/123,255, now U.S. Patent 6,387,531 to Bi et al., entitled "Metal (Silicon) Oxide/Carbon Composites," incorporated herein by reference. In particular, this application describes the production of anatase and rutile TiO_2. The production of aluminum oxide nanoparticles is described in copending and commonly assigned, U.S. Patent Application Serial Number 09/136,483 to Kumar et al., entitled "Aluminum Oxide Particles," incorporated herein by reference. In particular, this application disclosed the production of γ-Al_2O_3. Suitable liquid, aluminum precursors with sufficient vapor pressure of gaseous delivery include, for example, aluminum s-butoxide ($Al(OC_4H_9)_3$). Also, a number of suitable solid, aluminum precursor compounds are available including, for example, aluminum chloride ($AlCl_3$), aluminum ethoxide ($Al(OC_2H_5)_3$), and aluminum isopropoxide ($Al[OCH(CH_3)_2]_3$).

At page 32, lines 10-27, the paragraph has been amended as follows:

The production of iron and iron carbide is described in a publication by Bi et al., entitled "Nanocrystalline α-Fe, Fe_3C, and Fe_7C_3 produced by CO_2 laser pyrolysis," J. Mater. Res. Vol. 8, No. 7 1666-1674 (July 1993), incorporated herein by reference. The production of iron oxide nanoparticles is described in copending and commonly assigned U.S. Patent Application serial number 09/337,826, now U.S. Patent 6,080,337 to Kambe et al., entitled "Iron Oxide Particles," incorporated herein by reference. The production of nanoparticles of silver metal is